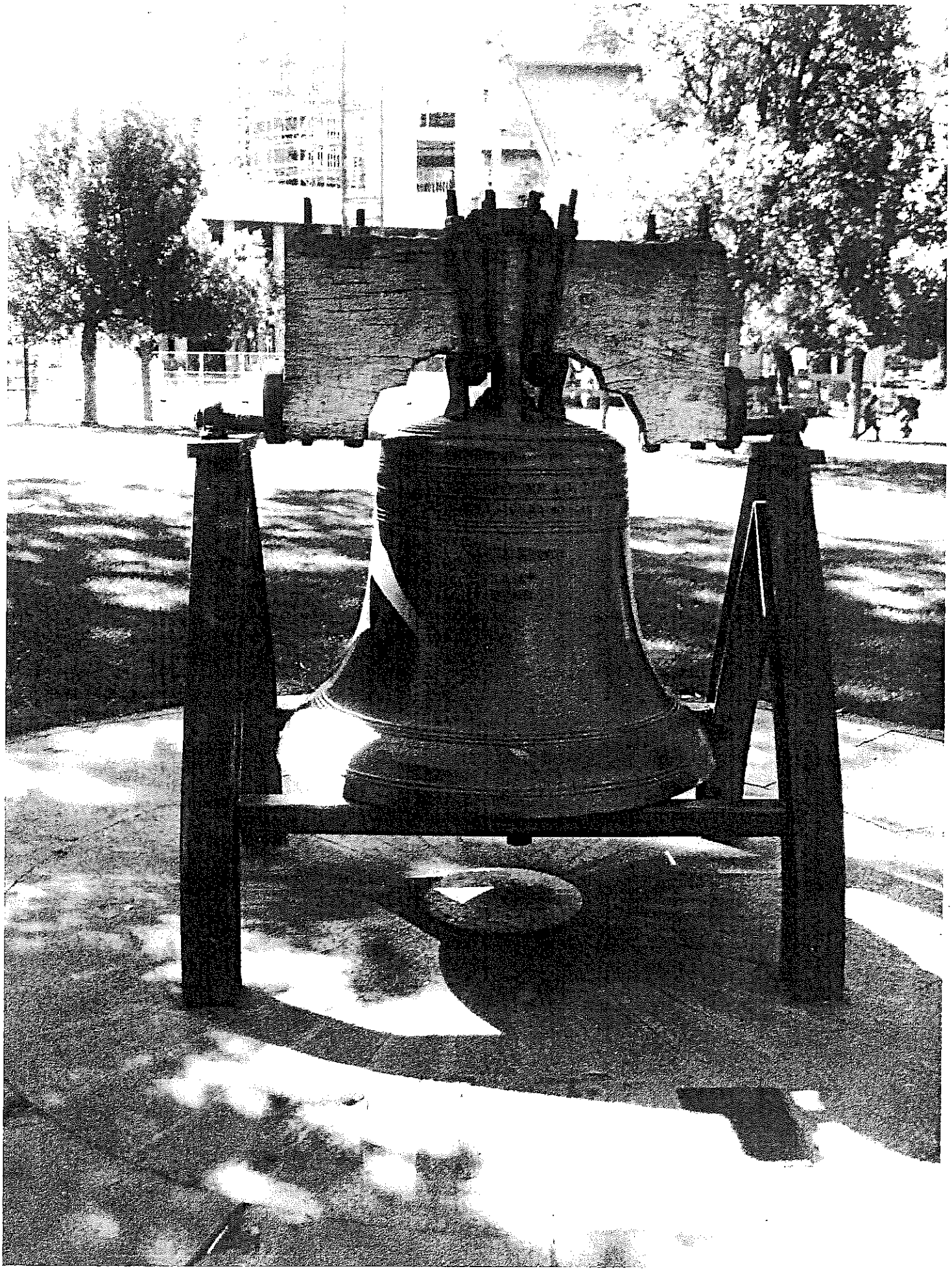

Attachment A

Crawford Conservation Studio

Conservation of Cultural and Fine Art objects
100 N. County Road 5
Ft. Collins, CO 80524
970-222-3193
crawfordmf@frii.com

Date:11/02/11

Conservation Treatment Proposal

Object:	Liberty Bell Replica	**Owner/Curator:**	State of Colorado
Artist/Provenience:		**Agent:**	Sue Johnson /Capitol Complex, the Capitol Building Advisory Committee and the Capital Development Committee
Age:	c. 1950	**Conservator:**	Matthew F. Crawford
Exam Date:	**11/02/11**		

Description: The full sized liberty bell replica is situated in Lincoln Park on the west side of the Colorado State Capital building lawn. The replica includes the wood yoke mounted to the bell cannons with threaded iron mounting rods and nuts similar to the mounting hardware seen on the original bell.. The bronze bell has been placed on a double A-frame steel support structure, fabricated from welded I-beam struts and rectangular bar stock cross members, so that the lip of the bell rests on the cross members. The bell and is steel mounting structure are centered in a concrete pad consisting of concentric rings radiating dividers. Commemorative plaques related to the bell are mounter into the concrete surround.

Condition:

The Bell:

Metal components of the bell exhibit typical surface deterioration consistent with age and weathering including tarnishing and light compact corrosion of the bronze and iron rust stains from run off corrosion from the steel components of the mounting rods. The original patina of the bronze is altered overall but in a manner consistent with natural weathering and patination of the metal.

The Steel mounting rods and collars at the end of the yoke exhibit compact surface corrosion consistent with age and weathering. There was no evidence of loose or active corrosion.

The wood yoke exhibits significant weathering and deterioration including cracking and checking of the wood structure. This structural deterioration of the wood is most notable in the cross grain at the ends of the yoke block and across the top of the block. Where water and ice tends to pool and accumulate. At the time of examination soft spots or extensive or active rot was detected in the wood.

The Structural Mount:

The Structural support is currently unstable due to a break in a weld between the leg and cross member at the SW corner of the mount structure. Other than this the mount structure exhibits irregular, moderate to heavy, compact surface corrosion but no loose or active corrosion was observed. The irregular nature of the surface corrosion is in part due incomplete surface coating of the steel. The steel frame work appears to have been painted at some time in the pas, now evident only in the central plates of the I-beam supports.

The Concrete Pad:

The pad appears structurally stable with no significant structural cracks, lifting or sinking of the concrete. There are numerous surface losses where thin sections of the surface have spalled off. This damage occurs along the seams and edges between the sections of concrete and is generally the result of freeze and thaw cycles

Treatment Recomendations:

The Bell:

Concerning the metal components of the bell, there is no evidence of active corrosion or structural deterioration. The surface corrosion and staining present are typical of age and weathering and appear compact and stable and should act as a passivating layer, which hinders further corrosion of the bronze. Beyond surfaces cleaning, treatment of the bell would be a curatorial decision regarding the aesthetics of the bell. The uneven weathering and patination of the bronze can not effectively be addressed by localized treatment. Instead a complete surface polishing and re-patination of the bronze would be necessary. This would ultimately destroy the natural weathering patina that has developed over time, remove existing material and set up the newly finished bronze to begin to weather and deteriorate again.

The Wooden Yoke:

While the wood exhibits more significant structural damage in the form of splitting along the top and checking at the sides, filling losses such as these in wood is generally not effective and can lead to further structural deterioration of the wood. My recommendation would be to treat the original wood structure with a wood preservative/sealant and fabricate a copper sheet metal cap to cover the top surface of the yoke. This would prevent water and ice and wind blown debris from building up in the existing crevices without create a binding or restrictive inclusion that would propagate further cracking. The metal cap would have a narrow (1/4" to 1/2") turned edge over the corner to keep water flowing down the face and not leaking back onto the top surface of the yoke. This I believe will protect the wood while creating a minimal visual impact on the bell.

The Steel Mounting Structure Including the steel mounting rods and nuts):

The broken weld should be repaired and the steel should be re-surfaced to remove partial surface coating and to restore a uniform appearance to the metal. After resurfacing all steel surfaces should be treated with a passivating solution the inhibit further rusting.

The Concrete Pad:

The spalling on the concrete pad present a difficult problem. Repair is possible but not likely to be visually acceptable because achieve an suitable color and texture match to the original concrete would be nearly impossible. Two alternative would be to accept the existing condition and seal the concrete to reduce the likelihood of continued spalling. The second option would be to remove the concrete pad and reinstall with new concrete.

Establish a Regular Maintenance Program:

Once treated the Liberty Bell and the component parts should receive regular upkeep and maintenance. This would include annual or (ideally) semi-annual inspection, cleaning and waxing of all metal surfaces and biennial preservative/sealant re-treatment of the wooden yoke

Estimated Treatment Cost (option 1):

This option includes minimally intrusive treatment and strives to preserve the currant weathered and aged appearance of the Liberty Bell . It is expected that all work will be done on-site.	**Time** (hrs)	**$0.00**
Surface clean the Bronze bell and the steel mounting rods and nuts	16	$1,440.00
Clean, apply preservative and fabricate/install metal cap to the wooden yoke	8	$720.00
Weld broken frame component		$500.00
Surface clean and treat steel structural mount	12	$1,080.00
Apply initial wax coating to all metal surfaces	6	$540.00
Apply sealant to existing concrete pad	6	$540.00
Materials and Supplies		$350.00
Travel and expenses		$250.00
Treatment Time:	42	
Total	**Total**	**$5,420.00**

(Treatment costs are calculated at a rate of $90.00/hr.)

This Estimate is based on the preliminary examination of the object and does not include treatment for unforeseen conditions that may be revealed during the course of the treatment. Significant changes in the treatment plan will be documented and submitted to the owner for approval as an addendum to this document, prior to completion of the treatment.

Estimated Treatment Cost (option 2):

This option is a more intrusive treatment which will include complete resurfacing and patination of the bronze bell. This will also require transporting the bell to a local foundry for the patination process.	Time (hrs)	$0.00
Dismantle the component parts of the bell for resurfacing and patination	6	$540.00
Fabrication of a new wood yoke from like material	8	$720.00
Resurface and patinate the bronze bell	24	$2,160.00
Surface clean and treat steel structural mount	12	$1,080.00
Weld broken frame component		$500.00
Reinstall the bell	6	$540.00
Apply initial wax coating to all metal surfaces	6	$540.00
Apply sealant to existing concrete pad	6	$540.00
Rigging and transporting the bell		$3,200.00
Materials and Supplies		$1,200.00
Travel and expenses		$350.00
Treatment Time:	68	
Total	**Total**	**$11,370.00**

(Treatment costs are calculated at a rate of $90.00/hr.)
This Estimate is based on the preliminary examination of the object and does not include treatment for unforeseen conditions that may be revealed during the course of the treatment. Significant changes in the treatment plan will be documented and submitted to the owner for approval as an addendum to this document, prior to completion of the treatment.

Estimated Treatment Cost (Concrete pad):

This option address repair of the concrete pad and is separate form any treatment of the bell itself	Time (hrs)	$0.00
Remove and dispose of existing concrete		$2,500.00
Reform, pour and finish new pad to match the original design and dimensions.		$7,000.00
Total	**Total**	**$9,500.00**

The concrete work would be done by an independent contractor. The estimate above is based on verbal description of the project and the amounts should be considered very rough estimates and subject to change upon direct inspection of the site and scope of work.